5. CONTENT MANAGEMENT AND BUSINESS PROCESSES

Content management describes how the creation of information is facilitated, and then stored and delivered to the user. The theory behind a successful content management architecture is not just in having a good technology but also in having the right business processes that takes the fullest advantage of a content management system. Basically, content production for a portal (and really any website) breaks down into two components: the processes by which content is created and the technological systems that facilitate its distribution. Both are critical and are as equally important. Without the right processes the technology will not be much more than some expensive pieces of hardware and software, and without the technology to facilitate, automate, and standardize the business processes, there will be no good methodology to bring together the myriad of processes that exist within NASA.

In the current NASA environment, content management often rests entirely with the content owner. He or she creates, manages, distributes, and maintains the content in near complete autonomy of all aspects, from factual veracity to graphic presentation. In a portal environment, content management becomes a more cooperative process. The content owner still creates the content and starts the publication process, but other aspects of publication, such as policy compliance or graphic presentation, may rest with a different person or group

A. BUSINESS PROCESSES

Part of the creation of a successful portal has little to do with the actual technology. Defining the business process by which content will be created, vetted, and approved for intended audiences is critical to managing the content. The business processes used to publish information at NASA are as diverse as the elements within the Agency. For example, NASA's Scientific and Technical Information group has long-standing processes that have served the Agency well, but which are different from the Office of Public Affairs' equally long-standing and effective processes.

Establishing business practices to be incorporated into a web/portal services model is the purview of the Web Services SRR team. Here it is appropriate to recommend a few operating principles. Before doing so, it might help to clarify how two specific terms are being used.

- Content creation -- the creation, compilation and rough organization of text and multimedia related to the topic at hand.
- Content management -- the formatting, whether for the Internet or other distribution media, workflow, distribution, and archiving of the material.

Principles

1) Content creation should remain with the owners of the content. They are the best qualified to know what kinds of information their audiences need and to ensure its accuracy and timeliness.

2) As a corollary, web/portal business processes should not include content review, but should rely on existing review processes. Material that has already been cleared through the creating office, such as press releases, should not have to be cleared by a web/portal review board.

3) Web/portal review should be of process, so that the Web Services Team, however that may be defined:

- Knows who the content owner is
- Knows the appropriate points of contact
- Has an agreement with content owners that covers:
    - Who will perform policy (e.g., Section 508, COPPA, privacy) and security reviews—the content owner, the web services group or other group responsible for a specific function
    - The kinds of content that will be provided
    - The intended audience
    - Frequency of updates
    - Relation of content to established information architecture
    - Retirement/archiving plans

4) Depending on how web/portal services are implemented across NASA, content management may also reside with the content creators. If that is the case, the agreement described in section 3 above should be expanded to cover topics such as NASA Webmasters Best Practices.

B. CONTENT MANAGEMENT SYSTEMS

Because there are so many different business processes for publishing in the Agency, it will be necessary to implement a technology that will facilitate and integrate these processes to present a unified front to the portal audiences. Several unique processes were mentioned above, such as those in Public Affairs, STI, content creation, and web/portal teams. The right kind of technology, through hosting site components in an object-oriented, database-driven architecture, will be able to incorporate all these disparate processes into the same system so that NASA can

- Make effective use of all internal resources
- Reduce time required to implement site changes, or re-design a site
- Ensure the availability of timely, accurate information
- Scale web site to keep pace with organizational growth

A typical content management system hardware configuration may look like the one shown in Figure 10. From the hardware perspective, it is important to evaluate potential systems to ensure compatibility with existing technologies and future requirements. Some things to consider: What client and server operating systems does it support? Is it scalable? How is the usability and manageability? What about security management and replication capabilities? What web application servers and development tools are supported? Does it integrate with legacy systems?

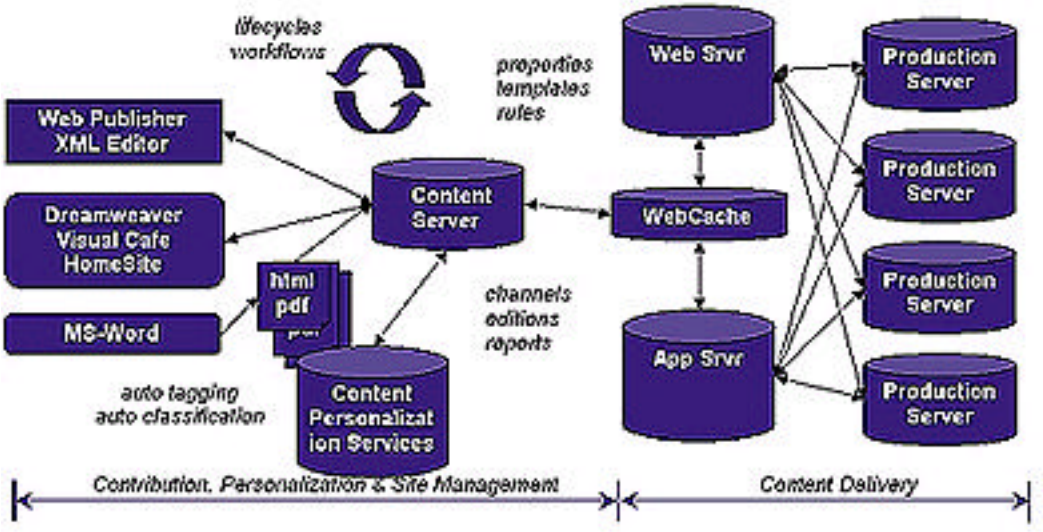

Figure 10. Content management hardware configuration (sample)

A typical content management system software configuration may look like the one shown in Figure 11. From a software perspective, it is important to evaluated functionality such as authoring capabilities, template creation, workflow, library services, access services, delivery services, personalization, and site management. For the most flexibility, the system should be modular, so that it can be scaled up or down when needed.

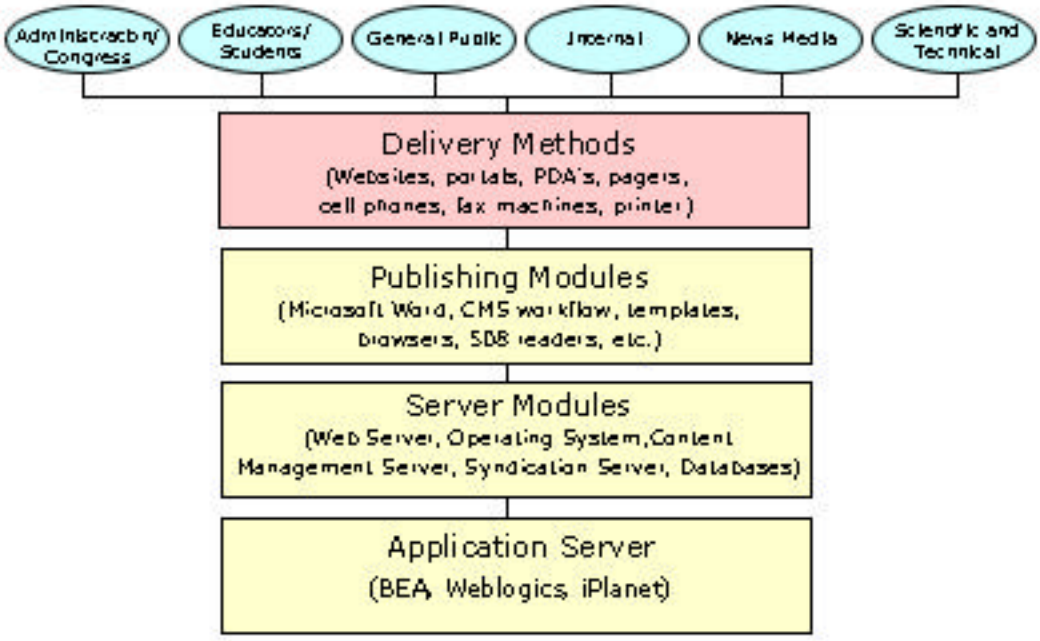

Figure 11. Content management system software configuration (sample)

A content management system encompasses a component-based architecture that separates content from presentation format and dynamic serving of content. Personalization of web content requires that content and presentation are not intertwined. That way the same information can be served up in various formats, depending upon the site users needs and interests. This capability, coupled with a page serving model that builds pages on-the-fly as they are requested, provides the foundation for delivering personalized content tailored to the user' s interests and/or browsing device (Figure 12).

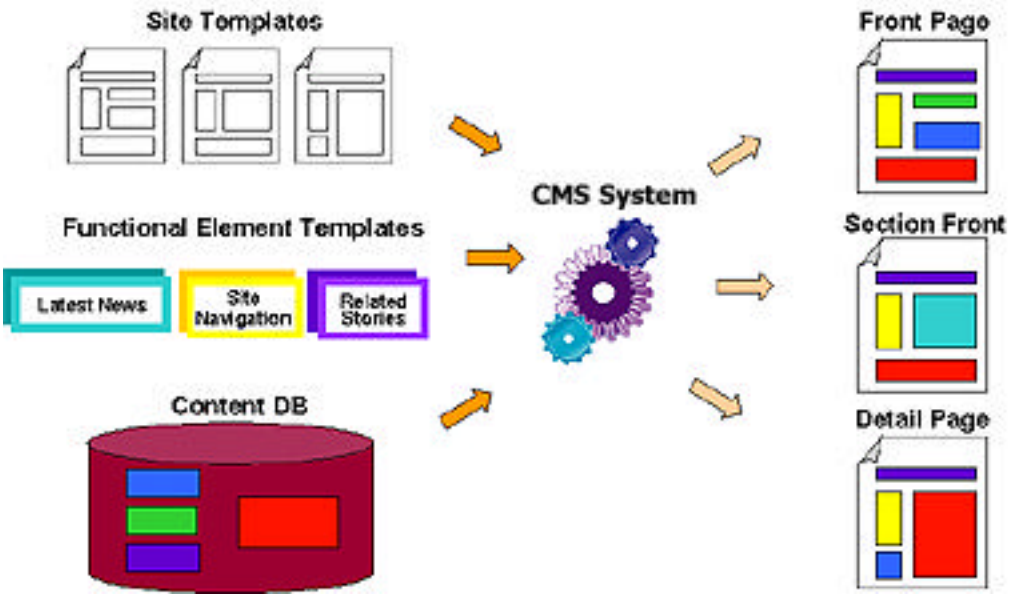

Figure 12. How content management can improve web publishing processes

Workflow - Improved business processes by automating. A workflow can be defined according to review and approval policies for each individual department or group to automatically route new web content through its approval cycle, decreasing the time it takes to get content approval.

Non-technical users can update site without affecting presentation - Decreased on-going maintenance costs. Once the initial structure of the site is built, maintaining it is done in a web form, making knowledge of html unnecessary. A content provider will simply fill out a web form with the appropriate information and hit "submit" to begin the approval workflow. The content provider will establish the posting date when inputting the information. Once the content has been routed and approved by all, it will automatically be posted on the appropriate day.

Reuse of content - improves data integrity and reduces server space needed. In many cases, more than one website will use the same information, but re-programmed to fit their own site design. A database-driven site stores individual site elements as objects in a database, pulling it together with a script into a template. With this structure, many templates can pull the same content object into their site, but it only is stored in the database once. This not only ensures data integrity, it also saves storage space.

C. TECHNICAL EVALUATION

A great deal of research has already taken place within centers and the Agency regarding vendors and products for content management technologies. However, it should be the responsibility of the Agency web Management group, once formed, to make the final decision for the Agency regarding a Content Management architecture. When deciding on a product the Web Management group should take, at least some of the following criteria into consideration:

- Functionality - Authoring Capabilities, Templates, Workflow, Library Services, Access Services, Delivery Services, Personalization, Site Management
- Technical Architecture - Client and Server Operating Systems, Scalability, Usability, Manageability, Security Management, Replication Capabilities, Application, Development Tools, Integration
- Cost - Initial Cost, Maintenance Cost
- Vendor Services - Professional Services (project management, consulting, integration, training); Support Services (availability, method of delivery, quality and responsiveness)
- Vendor Viability - Financial viability (based on financial performance over the last 3 years), Organizational Viability (how stable is their management structure), Market Viability (how strong are they in the government market).
- Vendor Vision - How vendor will evolve to incorporate new functionality into their product; Service Vision (support of their client moving forward); Company vision (What is their 3-5 year vision).